

WHAT IS CLAIMED IS:

- Sub
B1
1. A method for assessing the photo quality of a captured image in a digital camera, said method comprising:
checking, in-camera, the photo quality of the captured image to determine if the photo quality is acceptable; and
providing a corresponding photo quality feedback to a camera user.
 2. The method of claim 1 wherein the checking step comprises:
computing a photo sharpness figure of merit for the captured image; and
comparing said computed photo sharpness figure of merit to a threshold to determine if said photo sharpness figure of merit exceeds said threshold.
 3. The method of claim 2 wherein the computing step comprises:
generating a line pixel profile of the captured image;
computing an absolute difference in a channel gray level between adjacent pixels in the horizontal direction using said line pixel profile; and
picking the maximum absolute difference as the photo sharpness figure of merit.
 4. The method of claim 3 further comprising:
transforming the captured image from RGB color space into YCrCb color space.
 5. The method of claim 3 further comprising:
transforming the captured image from RGB color space into L*a*b* color space.
 6. The method of claim 2 wherein the computing step comprises:
generating a line pixel profile of the captured image;
computing the absolute difference in a channel gray level between adjacent pixels in the horizontal direction using said line pixel profile, said computed absolute difference constituting a plurality of data points;
ranking said data points in value;
dropping at least a top 1% of said ranked data points from consideration; and
picking a next top-valued data point as the photo sharpness figure of merit.

- 10074179-021202
7. The method of claim 6 further comprising:
transforming the captured image from RGB color space into YCrCb color space.
8. The method of claim 6 further comprising:
transforming the captured image from RGB color space into L*a*b* color space.
9. The method of claim 2 wherein the checking step comprises:
computing a magnitude of a two-dimensional gradient of a channel; and
picking a maximum two-dimensional gradient magnitude as the photo sharpness figure of merit.
10. The method of claim 9 further comprising:
transforming the captured image from RGB color space into YCrCb color space.
11. The method of claim 9 further comprising:
transforming the captured image from RGB color space into L*a*b* color space.
12. The method of claim 2 wherein the checking step comprises:
computing a magnitude of a two-dimensional gradient of a channel, said computed two-dimensional gradient magnitude constituting a plurality of data points;
ranking said data points in value;
dropping at least a top 1% of said ranked data points from consideration; and
picking a next top-valued data point as the photo sharpness figure of merit.
13. The method of claim 12 further comprising:
transforming the captured image from RGB color space into YCrCb color space.
14. The method of claim 1 wherein said checking step further comprises:
computing a face quality figure of merit for the captured image; and
comparing said computed face quality figure of merit to a threshold to determine if said face quality figure of merit exceeds said threshold.

15. The method of claim 14 wherein computing step comprises:
detecting facial image data from the captured image; and
converting said detected facial image data from RGB color space into $L^*a^*b^*$ color space.
16. The method of claim 15 further comprising:
computing the mean of L^* to obtain a brightness figure of merit.
determining if said brightness figure of merit falls within a brightness threshold range.
17. The method of claim 15 further comprising:
computing the local standard deviation of L^* to obtain a noise figure of merit; and
determining if said noise figure of merit exceeds a noise threshold.
18. The method of claim 15 further comprising:
computing the overall standard deviation of L^* to obtain a contrast figure of merit; and
determining if said contrast figure of merit falls within a contrast threshold range.
19. The method of claim 14 wherein computing step comprises:
detecting facial image data from the captured image; and
converting said detected facial image data into a binary mask of only white and black pixels, wherein said white pixels represent pixels of red color and said black pixels represent pixels of colors other than red; and
checking said binary mask for presence of white pixels.
20. The method of claim 1 wherein said checking step comprises:
computing a flare figure of merit for the captured image;
comparing said computed flare figure of merit to a threshold to determine if said flare figure of merit exceeds said threshold; and
providing a corresponding flare feedback to said camera user.
21. The method of claim 20 wherein the computing step comprises:
generating a binary mapping of the captured image containing only black and white pixels, said white pixels representing saturated pixels of the captured image; and
subdividing said binary mapping into a plurality of regions.

22. The method of claim 21 further comprising:
computing a percentage of white pixels in each region to obtain a flare figure of merit;
and
determining if said flare figure of merit in at least one region exceeds a flare threshold.

23. The method of claim 22 wherein said flare threshold is at least 50%.

24. A method for assessing the photo quality of a captured image in a digital camera, said method comprising the steps of:

computing, in-camera, a photo sharpness figure of merit for the captured image;
comparing, in-camera, said computed photo sharpness figure of merit to a threshold to determine if said photo sharpness figure of merit exceeds said threshold;
providing a corresponding photo sharpness feedback to a camera user;
computing, in-camera, a face quality figure of merit for the captured image;
comparing, in-camera, said computed face quality figure of merit to a threshold to determine if said face quality figure of merit exceeds said threshold;
providing a corresponding face quality feedback to said camera user;
computing, in-camera, a flare figure of merit for the captured image;
comparing, in-camera, said computed flare figure of merit to a threshold to determine if said flare figure of merit exceeds said threshold; and
providing a corresponding flare feedback to said camera user.

25. A system for assessing the photo quality of a captured image in a digital camera, said system comprising:

an image capture unit;
an image processor operatively coupled to said image capture unit for processing the captured image;
a photo quality check unit operatively coupled to said image processor for checking, in-camera, the photo quality of the processed image; and
a display operatively coupled to said photo quality check unit for providing a corresponding photo quality feedback to a camera user.

26. The system of Claim 25, wherein said photo quality check unit comprises:
a photo sharpness check module operatively coupled between said image processor and said display for checking in-camera the photo sharpness of the processed image;
a face quality check module operatively coupled between said image processor and said display for checking in-camera the face quality of the processed image; and
a flare check module operatively coupled between said image processor and said display for checking in-camera the processed image for presence of flare.

10074479-034302